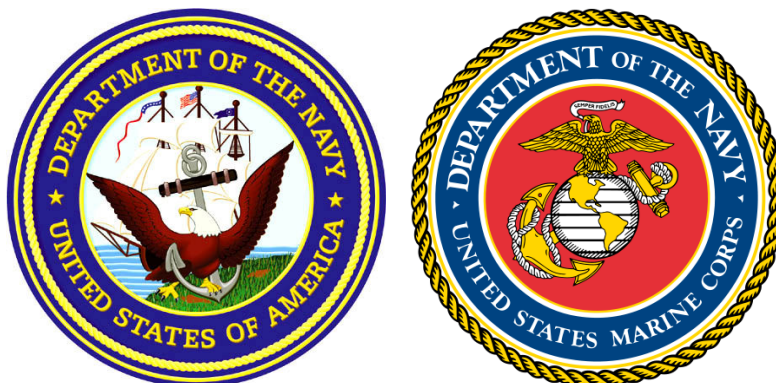


Naval Energy

A Strategic Approach



October 2009

Message from the Secretary of the Navy



I am committed to the Department of the Navy taking a leadership role in energy reform, not just within the Department of Defense, but in our country, in order to reduce our reliance on fossil fuels.

The underlying reasons for reform are clear. Our energy sources are not secure, we need to be more efficient in energy use, and we emit too much carbon. Over-reliance on fossil fuels is bad strategy, bad business, and bad for the planet. The Department of Defense alone uses 93 percent of the Federal Government's energy and is the largest single consumer of energy in the United States. Effecting change within the Navy and Marine Corps will have a significant and lasting impact upon our national energy consumption and national energy policy.

I challenge each of you to enter the discussion ready to take bold steps to reduce use of fossil fuels and advocate for changes to established practices. Algae, grain, cellulose, seawater, waves, wind, solar, and geothermal are some of the sources of the future; we need you to put your minds and your imagination to work to figure out how to harness them. More importantly, I challenge you to think beyond existing technologies and to dream of what today might seem unimaginable.

Reforming energy use and policy within the Department of the Navy will assure the long-term energy security of the United States, encourage development of efficiencies, and promote environmental stewardship. In doing so, we will improve the combat and operational effectiveness of our Forces and maintain our position as the finest Navy and Marine Corps in the world.

Honorable
Ray Mabus
Secretary of the Navy

Vision

Energy Security

Energy security is critical to our success. We will safeguard our energy infrastructure and shield ourselves from a volatile fuel supply.

We will:

- Deploy the 21st-century “Great Green Fleet”
- Aggressively reduce our reliance on fossil fuels
- Secure a sufficient, reliable, and sustainable energy supply



Energy Efficiency

Energy efficiency increases our combat effectiveness. We will expand our tactical reach and minimize operational risks, saving time, money, and lives. We all take responsibility for energy efficiency.

We will:

- Incentivize industry to be more efficient
- Accelerate energy efficient technologies through greater investment in RDT&E
- Adapt operational policies and doctrine to value energy as a strategic asset

Environmental Stewardship

Environmental stewardship is our responsibility. We will reduce the environmental impacts of our energy use, lead in reducing greenhouse gas emissions, and promote sustainability.

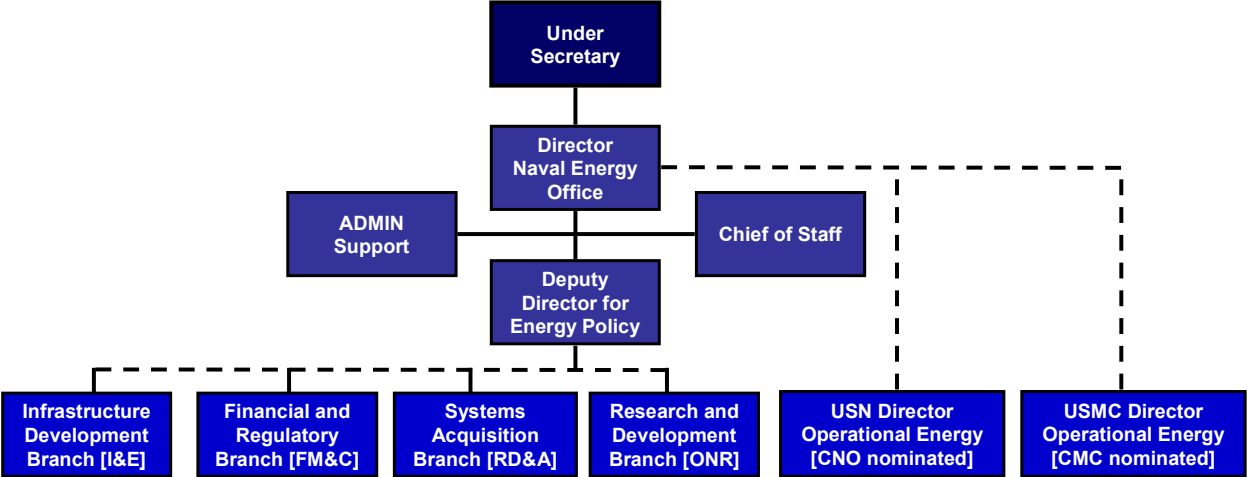
We will:

- Swiftly adopt cutting-edge low-carbon technologies
- Consider carbon emissions in our daily operations and our procurements
- Replace energy from fossil fuels with energy from alternative and renewable sources



Governance

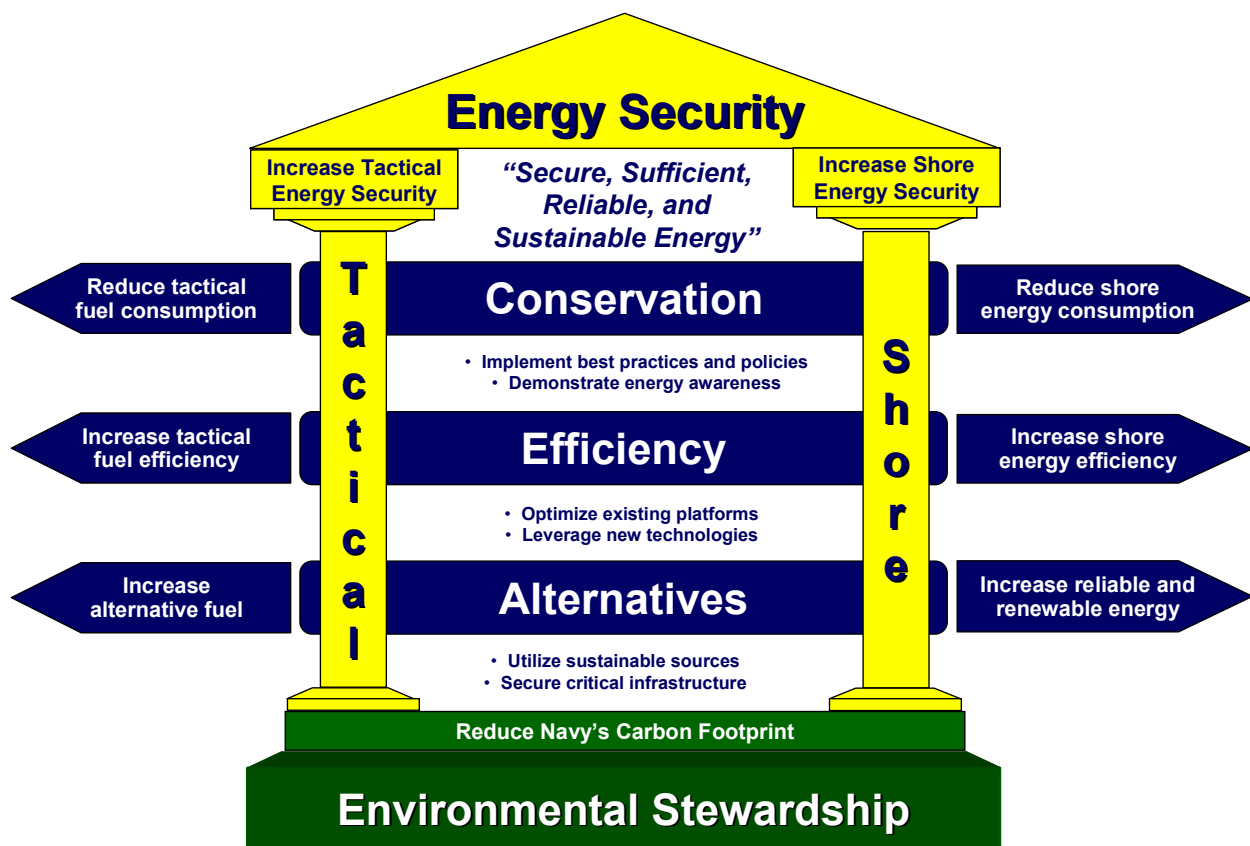
The Naval Energy Office is the principal advisor to the Secretary of the Navy for energy issues and the day-to-day executive for the Secretary's energy-related responsibilities across all DON operational and shore activities. The office is developing policy and guidance to empower a robust portfolio of energy investments that will improve energy security and increase operational and combat effectiveness. The office will take on the DON energy leadership role in collaboration with Navy and Marine Corps operational energy offices.



Strategic Approach

The Department of the Navy Energy Strategy establishes a set of aggressive goals to increase combat effectiveness. The departmental goals seek to increase tactical and shore energy security and reduce greenhouse gas emissions. The goals call for DON-wide reductions in consumption, increases in energy efficiency, the replacement of petroleum sources of energy with alternative sources where possible, and securing critical infrastructure. The goals encompass the full range of Navy and Marine Corps operations.

Implementation of the Naval Energy Strategy will require a variety of actions from Navy and Marine Corps enterprises. Each of the enterprise communities are committed to increasing energy security, conducting a detailed review of policy and doctrine, and making strong investments in existing and new technologies.



“We have made great strides in increasing our energy efficiency, reducing energy consumption, and capitalizing on renewable energy sources... We have to do much more.”

- The Honorable Ray Mabus

Tactical Energy Security

Tactical energy security is protection from vulnerabilities related to the energy requirements of tactical platforms by reducing risk associated with a logistics tail, volatile petroleum prices, and the instability of unfriendly petroleum suppliers. The Navy increases tactical energy security by decreasing overall liquid fuel consumption, increasing the fuel efficiency of tactical platforms, and using alternative fuels.

The Department of Navy's current energy demand creates multiple vulnerabilities for tactical platforms. Ships, aircraft, and ground vehicles must frequently receive new supplies of fuel. At sea, ships are most vulnerable alongside an oiler during underway replenishment. In the air, refueling costs are increased by an expensive logistics tail. On the ground, convoys of tanker trucks are magnets for insurgent attacks, putting lives at risk and drawing forces away from the fight. To mitigate these risks, the maritime, aviation, and expeditionary communities are developing policies and technologies that will lead to greater combat capability, less dependence on petroleum, and a reduced carbon footprint.

Maritime

The maritime community of the Navy has been forward-leaning in its approach to energy, especially with respect to quick-win technologies such as stern flaps and culture change through the Incentivized Energy Conservation program. Retrofitting existing ships with energy efficient technologies will require considerable investment in research and implementation. The Navy has already deployed an efficient auxiliary propulsion system on USS Makin Island and is making additional strategic long-term investments, such as in hybrid electric drive technology for DDG-51s. The maritime community will continue to focus on new technologies for the current fleet, while incorporating energy in the strategic planning, design, and acquisitions process for future classes. A strong combination of technological and operational efficiencies will provide a mission advantage for U.S. maritime forces.

Aviation

The aviation community of the Navy and Marine Corps seeks to ensure that tactical and support aircraft become more efficient while maintaining or improving current readiness levels. With the engagement of senior leadership, the aviation community will increase efficiency and reduce overall fuel consumption through the integration of new technologies, leading to significant improvements in engine performance, flight management, and simulation, as well as changes to operating procedures and policy.

Expeditionary

The expeditionary community includes Marine Corps ground forces and Navy units that extend maritime operations inland. Expeditionary energy applications range from portable energy storage systems for small teams to power generation systems for entire base camps. The expeditionary community will

work toward lightening the load and reducing the fuel consumption of vehicles, generators, and other equipment. This reduces exposure to attacks on supply lines, saving lives, equipment, and money.

Fuels

The majority of surface ships and all aircraft and ground vehicles run on petroleum-based fuels. The fuels community is testing and certifying biofuels derived from renewable sources for use in tactical platforms. Alternatives to petroleum will ensure a sustainable domestic fuel supply.

Tactical Energy Goals

Increase Tactical Energy Security

Reduce tactical fuel consumption

Increase tactical fuel efficiency

Increase use of alternative fuels

Reduce Navy's Carbon Footprint



Shore Energy Security

Shore energy security is protection from vulnerabilities related to the commercial electrical grid, which is susceptible to physical and cyber attack, natural disaster, and malfunction. The Navy increases shore energy security by decreasing energy consumption, increasing energy efficiency, increasing the use of alternatives, and increasing the reliability of its energy supply to critical assets.

The vulnerabilities of the Nation’s electric grid, rising energy prices, and growing concerns over greenhouse gas emissions have converged to pose significant challenges to the shore community of DON. Congress and the President have produced legislation and policies aimed at reducing energy consumption and increasing production of renewable energy at Federal facilities. Building on a strong history in efficiency and renewables, the Department of the Navy will meet these mandates with initiatives in advanced energy management, energy and water conservation, sustainable infrastructure, renewable and alternative energy on DON land, alternative fuel vehicles, and ultimately converting its bases to net-zero energy consumers. To ensure continuity of shore mission capability through man-made and natural contingencies, the shore community seeks to provide reliable energy for critical infrastructure.

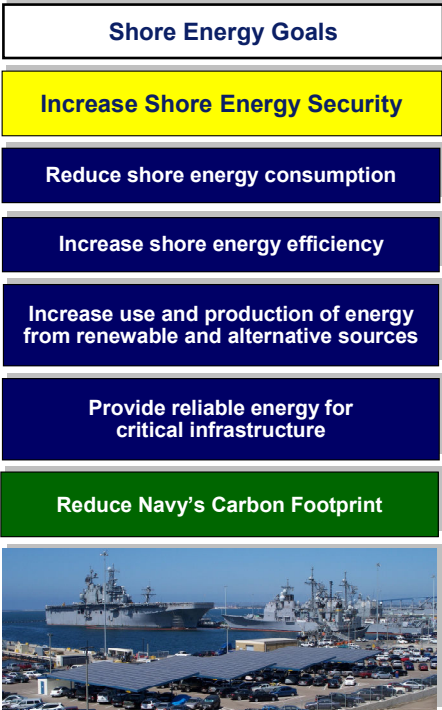
Energy Management

The shore community has successfully decreased the energy consumption of its facilities for years by applying sustainable design principles and introducing efficient building technologies. The Navy will build on successes in energy management and continue to be early adopters of leading-edge technologies. Advanced metering will provide the foundation for a smart grid with near real-time knowledge of energy consumption and provide the ability to better focus efforts to reduce consumption and energy

intensity (energy per square foot). Shore leadership will drive culture change until energy is a significant factor in every decision.

Alternative Energy

The shore community has had notable achievements in renewable energy, such as the 270-megawatt geothermal power plant at Naval Air Weapons Station China Lake. The shore community continues to invest in initiatives in solar, wind, and geothermal energy, as well as leading-edge technologies such as ocean thermal energy conversion, wave energy, and kinetic hydropower. Alternative energy technologies will enable some bases to become net zero consumers of grid power. In pursuing distributed renewable generation opportunities, the Navy faces many of the same challenges that all organizations face, including transmission capacity limits, utility regulatory structure limits, environmental compatibility, storage technology, and high unit material cost. The shore community will also continue



to convert the fleet of non-tactical vehicles to fuel-efficient hybrids, low-speed vehicles, and alternative fuel vehicles and develop the infrastructure to support them. While increased production of energy from alternative/renewable sources will principally improve our resilience from the commercial grid, it also reduces greenhouse gas emissions and spurs national energy innovation.



Naval Energy Office
Office of the Secretary of the Navy
Washington, DC